

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims:**

1           **Claim 1 (currently amended):** A method of making  
2       hollow, reinforced plastic composite articles, comprising  
3       the steps of:  
4             cutting thermoplastic fibers to form a plurality of  
5       discrete thermoplastic fibers;  
6       ~~a) providing;~~  
7       ~~i) forming a hollow preform comprised of a~~  
8       cylindrical sidewall portion, a domed bottom portion, and  
9       a domed top portion, wherein one or more of said portions  
10       include a plurality of discrete reinforcing fibers separate  
11       from and intimately intermixed with [[a]] said plurality of  
12       discrete thermoplastic fibers, ~~said preform having a~~  
13       ~~cylindrical sidewall portion, a domed bottom portion, and~~  
14       ~~a domed top portion, and;~~  
15       ~~ii) providing a rigid mold having a cylindrical~~  
16       sidewall portion and domed end portions corresponding to  
17       said preform portions;  
18       b) ~~positioning~~ said preform against the inner  
19       surface of said corresponding mold portions;

20           c)——compressing said preform with an internally  
21    pressurized, inflatable core having a cylindrical sidewall  
22    portion, and top and bottom dome portions to hold said  
23    preform in place;

24           d)——heating said preform to a temperature sufficient  
25    to melt said thermoplastic fibers while the pressure in  
26    said inflatable core compresses said preform and  
27    distributes thermoplastic material from said thermoplastic  
28    fibers throughout said preform to provide a fiber  
29    reinforced molded article;

30           e)——cooling said molded article until said  
31    thermoplastic material is substantially solid;

32           f)——reducing the pressure in said inflatable core;  
33    and

34           g)——removing said molded article from said mold.

1           **Claim 2 (previously presented):** The method of claim  
2    1 wherein the pressure in said inflatable core is increased  
3    during the heating step to compress said preform and  
4    maintain the distribution of thermoplastic material  
5    throughout said preform, whereby voids in the fiber  
6    reinforced molded article may be further reduced.

1           **Claim 3 (original):** The method of claim 1 wherein  
2       said hollow preform comprises a separately preformed  
3       sidewall portion and integrated bottom portion and a  
4       separately preformed top dome portion.

1           **Claim 4 (original):** The method of claim 1 wherein  
2       said hollow perform comprises a separately preformed  
3       cylindrical sidewall portion and comprises separately  
4       preformed domed portions.

1           **Claim 5 (previously presented):** The method of claim  
2       4 wherein the separately preformed domed portions are  
3       comprised of filament wound isotensoid portions.

1           **Claim 6 (original):** The method of claim 5 wherein the  
2       sidewall portions overlap the domed portions.

1           **Claim 7 (currently amended):** The method of claim 4  
2       wherein said cylindrical sidewall portion is formed from a  
3       rectangular blanket of ~~said~~ reinforcing fibers intimately  
4       intermixed with ~~said~~ thermoplastic material, said blanket  
5       being positioned against said cylindrical sidewall portion  
6       of the mold with a slight overlap of opposite ends of said  
7       blanket.

8           **Claim 8 (original):** The method of claim 1 wherein the  
9   ratio of reinforcing fiber to thermoplastic material is  
10   substantially constant throughout said preform.           b

1           **Claim 9 (original):** The method of claim 8 wherein  
2   said ratio is approximately 3:2.

1           **Claim 10 (previously presented):** The method of claim  
2   1 wherein the ratio of reinforcing fiber to thermoplastic  
3   material varies within said preform.

1           **Claim 11 (original):** The method of claim 1 wherein  
2   the wall thickness of said preform is substantially  
3   constant.

1           **Claim 12 (original):** The method of claim 1 wherein  
2   the wall thickness of said preform varies along its length.

1           **Claim 13 (original):** The method of claim 1 wherein  
2   said reinforcing fibers are glass fibers.

1           **Claim 14 (original):** The method of claim 13 wherein  
2   said glass fibers are approximately 1 inch in length.

3           **Claim 15 (original):** The method of claim 1 wherein  
4       said thermoplastic material is chosen from the group  
5       comprised of: polypropylene, polyethylene, polybutylene  
6       terephthalate, polyethylene terephthalate, and nylon.

1           **Claim 16 (original):** The method of claim 1 further  
2       comprising, prior to said compressing, the step of treating  
3       the outer surface of said inflatable core with an adhesive  
4       agent so that said core is bonded to the interior of said  
5       molded article.

1           **Claim 17 (original):** The method of claim 1 further  
2       comprising, prior to said compressing, the steps of:

3           treating a surface of one of the top and bottom dome  
4       portions and an adjacent sidewall portion of said  
5       inflatable core with an adhesive agent to provide an  
6       adhesive coated portion; and

7           treating a surface of another of said top and bottom  
8       dome portions and an adjacent sidewall portion with a  
9       releasing agent to provide a release coated portion; and,  
10       after said removing, the step of:

11           disengaging the release coated portion of said  
12       inflatable core from an inner surface of said molded

13 article while the adhesive coated portion remains adhered  
14 to an inner surface of said molded article.

1       **Claim 18 (original):** The method of claim 1 further  
2 comprising, prior to said compressing, the step of treating  
3 the outer surface of said inflatable core with a releasing  
4 agent; and, after removing said molded article from the  
5 mold, the step of removing said inflatable core from said  
6 molded article.

1       **Claim 19 (original):** The method of claim 1 wherein  
2 said temperature is approximately 400 °F and maintaining  
3 said temperature for a period of at least approximately 30  
4 minutes.

1       **Claim 20 (original):** The method of claim 2 wherein  
2 said pressure is increased to approximately 2530 psi.

**Claims 21-23 (canceled)**

1       **Claim 24 (original):** The method of claim 1 wherein  
2 said inflatable core is a neoprene bladder.

1           **Claim 25 (original):** The method of claim 1 further  
2           comprising the step of connecting said mold to a source of  
3           vacuum during the heating step to further reduce the  
4           incidence of voids in the finished article.

1           **Claim 26 (original):** The method of claim 2 further  
2           comprising the step of connecting said mold to a source of  
3           vacuum during the heating step to further reduce the  
4           incidence of voids in the finished article.

1           **Claim 27 (currently amended):** A method of making  
2           hollow, reinforced plastic composite articles, comprising  
3           the steps of:  
4           ~~\_\_\_\_\_ a) \_\_\_\_\_ providing.~~  
5           ~~\_\_\_\_\_ i) \_\_\_\_\_ forming~~ a hollow preform comprised of a  
6           cylindrical sidewall portion, a domed bottom portion, and  
7           a domed top portion, said forming including the steps of:  
8           \_\_\_\_\_ providing a plurality of discrete reinforcing fibers;  
9           ~~intimately intermixed with~~  
10          \_\_\_\_\_ providing a plurality of discrete cut thermoplastic  
11          fibers; and[[,]] ~~said-forming preform having one or more of~~  
12          said [[a]] cylindrical sidewall portion, [[a]] domed bottom  
13          portion, and [[a]] domed top portion by collecting said  
14          plurality of discrete reinforcing fibers and said plurality

15 of discrete thermoplastic fibers onto a vacuum screen to  
16 form said one or more portions;

17 ~~———— ii) —~~ providing a hollow ~~plastic~~ liner within said  
18 preform, said liner having a cylindrical sidewall portion,  
19 a domed bottom portion, and a domed top portion; ~~and~~

20 ~~———— iii) —~~ providing a rigid mold having a cylindrical  
21 sidewall portion and domed end portions corresponding to  
22 said preform portions;

23 ~~———— b) —~~ positioning said preform against the inner  
24 surface of said corresponding mold portions;

25 ~~———— c) —~~ heating said preform sufficient to melt said  
26 thermoplastic fibers and distribute thermoplastic material  
27 from the thermoplastic fibers throughout said preform to  
28 provide a fiber reinforced molded article;

29 ~~———— d) —~~ cooling said molded article until said  
30 thermoplastic material is substantially solid; and

31 ~~———— e) —~~ removing said molded article from said mold.

1        **Claim 28 (currently amended):** The method of claim 27  
2 wherein said ~~plastic~~ liner is a thermoplastic liner.

1        **Claim 29 (currently amended):** The method of claim 27  
2 further comprising, during said heating, the step of  
3 pressurizing the ~~plastic~~ liner with a gas or a fluid; and



4 prior to removing said molded article from the mold, the  
5 step of reducing the pressure in said plastic liner.

1       **Claim 30 (original):** The method of claim 29 further  
2 comprising, during said heating, the step of connecting  
3 said mold to a source of vacuum during the pressurizing  
4 step to further reduce the incidence of voids in the  
5 finished article.

1       **Claim 31 (previously presented):** A method of making  
2 hollow, reinforced plastic composite articles, comprising  
3 the steps of:

4       a) providing:

5               i) a hollow preform of glass reinforcing fibers  
6 approximately one inch long intimately intermixed with  
7 separate thermoplastic fibers approximately two inches  
8 long, wherein the ratio of glass fibers to resin fibers is  
9 approximately 3:2 uniformly throughout said preform, said  
10 preform having a cylindrical sidewall portion, a domed  
11 bottom portion, and a domed top portion, and

12               ii) a rigid mold having a cylindrical sidewall  
13 portion and domed end portions corresponding to said  
14 preform portions;

- 15           b)     positioning said preform against the inner  
16     surface of said corresponding mold portions;
- 17           c)     compressing said preform with an internally  
18     pressurized, flexible inflatable core having a cylindrical  
19     sidewall portion, and top and bottom dome portions to hold  
20     said preform in place;
- 21           d)     heating said preform to approximately 400 degrees  
22     F while maintaining that temperature for between 20 and 60  
23     minutes, while also increasing the pressure in said  
24     inflatable core to approximately 25-30 psi to compress said  
25     preform and maintain the distribution of the thermoplastic  
26     material throughout said preform to provide a substantially  
27     void free fiber reinforced molded article;
- 28           e)     cooling said molded article until said  
29     thermoplastic material is substantially solid;
- 30           f)     reducing the pressure in said inflatable core;
- 31           g)     removing said molded article from said mold; and
- 32           h)     removing said inflatable core from the molded  
33     article.

1           **Claim 32 (previously presented):** The method of claim  
2     31 further comprising the step of connecting said mold to  
3     a source of vacuum during said heating to further reduce  
4     the incidence of voids in the finished article.

Claims 33-34 (canceled)

1           Claim 35 (previously presented): A method of making  
2   hollow, reinforced plastic composite articles, comprising  
3   the steps of:

4           a)    providing:

5                i)    a hollow preform comprised of a plurality of  
6   discrete reinforcing fibers intimately intermixed with a  
7   thermoplastic material, said preform having a cylindrical  
8   sidewall portion, a domed bottom portion, and a domed top  
9   portion, and

10              ii) a rigid mold having a cylindrical sidewall  
11   portion and domed end portions corresponding to said  
12   preform portions;

13           b)    positioning said preform against the inner  
14   surface of said corresponding mold portions without a prior  
15   winding step;

16           c)    compressing said preform with an internally  
17   pressurized, inflatable core having a cylindrical sidewall  
18   portion, and top and bottom dome portions to hold said  
19   preform in place;

20           d)    heating said preform to a temperature sufficient  
21   to melt said thermoplastic material while the pressure in  
22   said inflatable core compresses said preform and maintains

23 the distribution of the thermoplastic material throughout  
24 said preform to provide a fiber reinforced molded article;  
25 e) cooling said molded article until said  
26 thermoplastic material is substantially solid;  
27 f) reducing the pressure in said inflatable core;  
28 and  
29 g) removing said molded article from said mold.

1 Claim 36 (currently amended): A method of making  
2 hollow, reinforced plastic composite articles, comprising  
3 the steps of:

4 a) providing:

5 i) a discrete cylindrical sidewall portion, a  
6 discrete domed bottom portion, and a discrete domed top  
7 portion;

8 ii) a rigid mold having a cylindrical sidewall  
9 portion and domed end portions corresponding to said  
10 preform portions; and

11 ~~ii)~~ iii) a flexible, inflatable core;

12 b) positioning said discrete cylindrical sidewall  
13 portion, said discrete domed bottom portion, and said  
14 discrete domed top portion against the inner surface of  
15 said corresponding mold portions such that said cylindrical  
16 sidewall portion overlaps each domed portion to form a

17 preform having said core inserted into an interior of said  
18 preform;

19 c) inflating said core for compressing and  
20 pressurizing said preform to hold said preform in place;

21 d) heating and pressurizing said preform for a  
22 period of time to compress said preform and maintain the  
23 distribution of the thermoplastic material throughout said  
24 preform to provide a substantially void free fiber  
25 reinforced molded article;

26 e) cooling said molded article until said  
27 thermoplastic material is substantially solid;

28 f) reducing the pressure in said inflatable core;

29 g) removing said molded article from said mold; and

30 h) removing said inflatable core from the molded  
31 article.

1 **Claim 37 (previously presented):** The method of claim  
2 36, wherein one or more of said discrete cylindrical  
3 sidewall portion, said discrete domed bottom portion, and  
4 said discrete domed top portion are comprised of a  
5 plurality of discrete reinforcing fibers intimately  
6 intermixed with a plurality of discrete thermoplastic  
7 fibers.

1       Claim 38 (new) A method of making hollow, reinforced  
2       plastic composite articles, comprising the steps of:  
3       cutting thermoplastic fibers to form a plurality of  
4       discrete cut thermoplastic fibers;  
5       forming a hollow preform comprised of a cylindrical  
6       sidewall portion, a domed bottom portion, and a domed top  
7       portion, said forming including the steps of:  
8       providing a plurality of discrete reinforcing fibers,  
9       and  
10       forming one or more of said cylindrical sidewall  
11       portions, domed bottom portion, and said domed top portion  
12       by collecting said plurality of discrete reinforcing fibers  
13       and said plurality of discrete thermoplastic fibers onto a  
14       vacuum screen to form said one or more portions;  
15       providing a rigid mold having a cylindrical sidewall  
16       portion and domed end portions corresponding to said  
17       preform portions;  
18       positioning said preform against the inner surface of  
19       said corresponding mold portions; and  
20       heating said preform sufficient to melt said  
21       thermoplastic fibers and distribute thermoplastic material  
22       from the thermoplastic fibers throughout said preform to  
23       provide a fiber reinforced molded article.

1       Claim 39 (new): The method of claim 38, further  
2       comprising the step of providing a hollow liner within said  
3       preform prior to said positioning step.

1       Claim 40 (new): The method of claim 39 further  
2       comprising, during said heating, the step of pressurizing  
3       the liner with a gas or a fluid.

1       Claim 41 (new): The method of claim 39 wherein said  
2       liner is a thermoplastic liner.

1       Claim 42 (new): The method of claim 38 further  
2       comprising, during said heating, the step of connecting  
3       said mold to a source of vacuum during the pressurizing  
4       step to further reduce the incidence of voids in the  
5       finished article.